



U.S. DEPARTMENT OF
ENERGY

Nuclear Energy

Fuel Cycle Options (FCO) Campaign

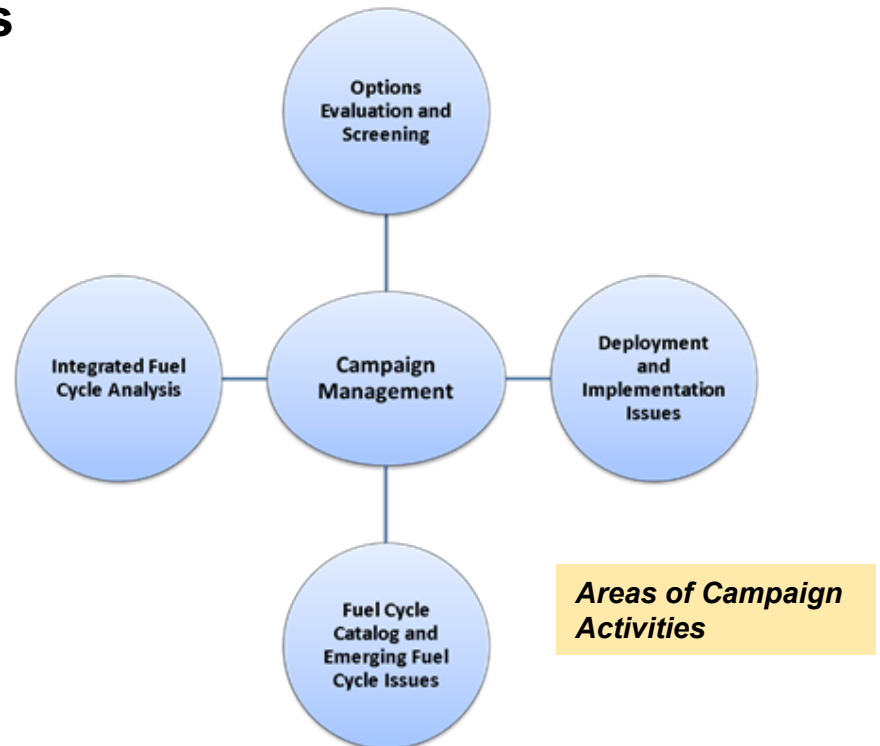
Patricia Paviet, Director, Office of Systems Engineering and Integration

**NEUP Webinar
August 14, 2014**



Campaign Objective

- **Develop and implement analysis processes and tools and perform integrated fuel cycle evaluations to provide information that can be used to objectively and transparently inform DOE-NE as decisions are made about overall R&D directions and to integrate Office of Fuel Cycle Technologies activities through R&D efforts on common fuel cycle goals**





Campaign Focus Areas

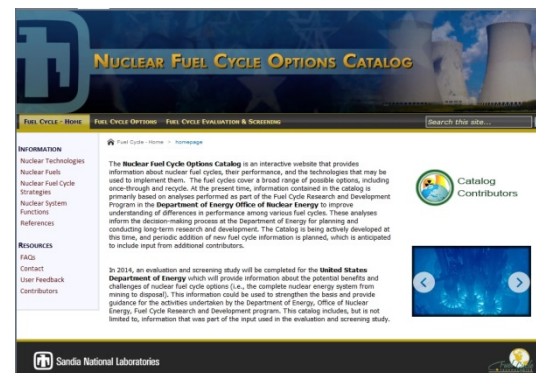
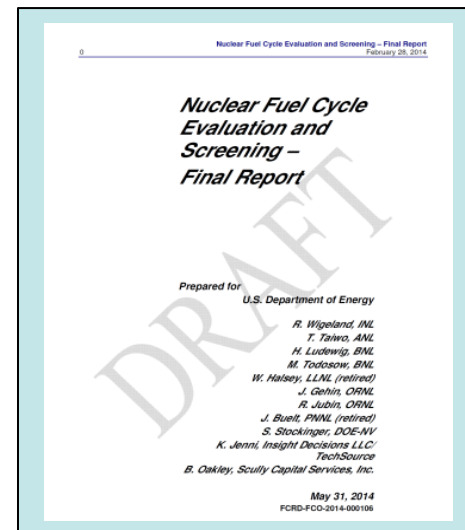
Nuclear Energy

- **Develop and manage processes that can be used for guiding selection of one or more sustainable alternative fuel cycle options and prioritizing research and development**
- **Perform analyses and studies of fuel cycle options that are objective and reproducible**
- **Contribute to the development of knowledge management systems that support transparent decision making for research and development investments and ensure that past, present and future program results are traceable and available**
- **Develop the approaches and materials for communication of FCT program objectives, values, and accomplishments to stakeholders**



Recent Activities in Campaign

- Complete fuel cycle evaluation and screening (E&S) to identify promising fuel cycle options that have the potential for substantial improvement compared to the current U.S. fuel cycle and issue associated reports and documents
- Initiate and conduct detailed analyses on the transition and deployment of promising fuel cycle option groups identified from the E&S Study
- Initiate development of enhanced economic analysis capabilities
- Initiate and conduct detailed analyses of the fuel cycle options contained in the promising fuel cycle option groups to develop further understanding of beneficial fuel cycle characteristics
- Develop the publicly-available Fuel Cycle Catalog

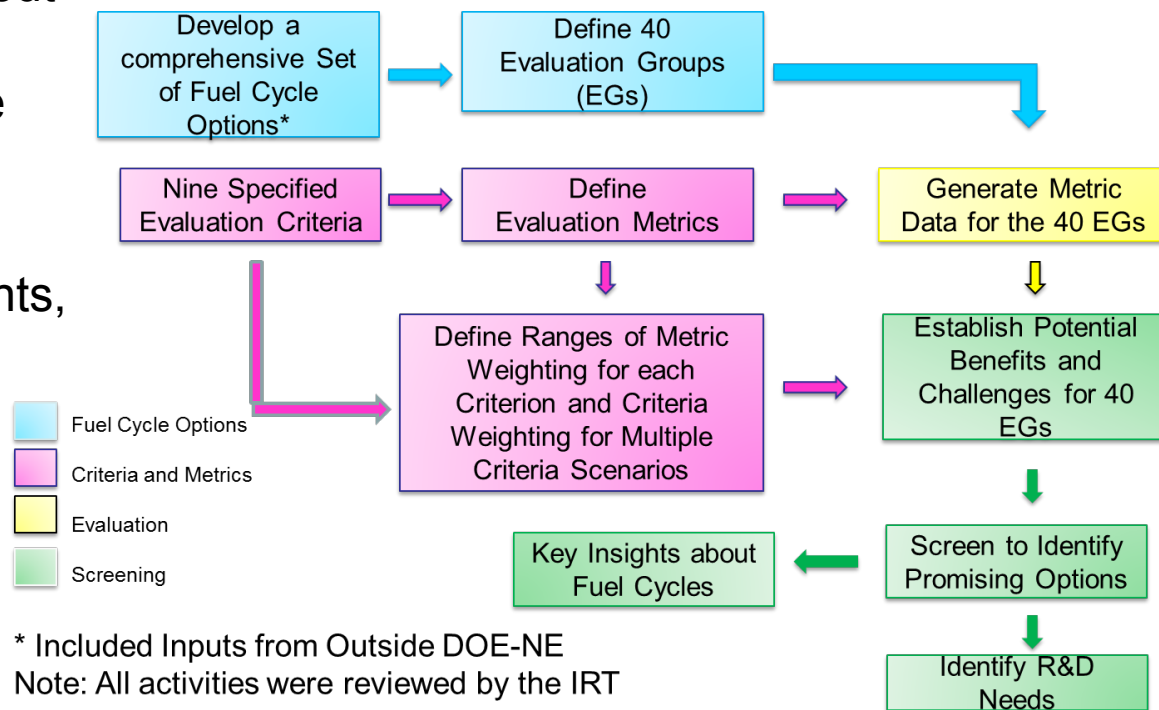




The Evaluation and Screening of Nuclear Fuel Cycle Options

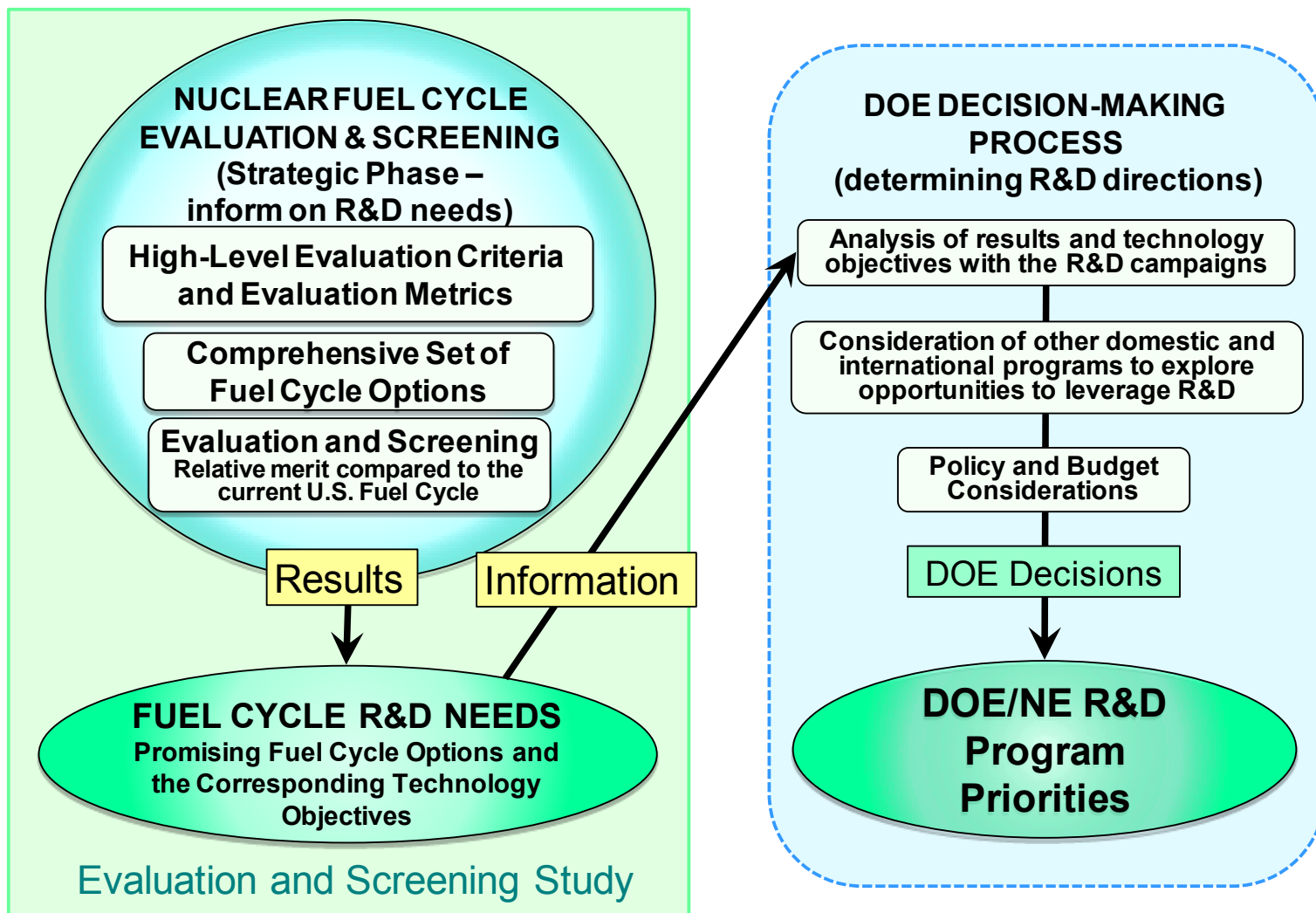
■ DOE-NE chartered the Evaluation and Screening Study to strengthen the basis for DOE-NE R&D decisions

- Provide information about potential benefits & challenges of fuel cycle options
- Identify potential for substantial improvements, using nine evaluation criteria





Informing DOE Nuclear Energy R&D Decision-Making





U.S. DEPARTMENT OF
ENERGY

Nuclear Energy

Catalog Home Page

[https://connect.sandia.gov/sites/
NuclearFuelCycleOptionCatalog](https://connect.sandia.gov/sites/NuclearFuelCycleOptionCatalog)



NUCLEAR FUEL CYCLE OPTIONS CATALOG

[FUEL CYCLE - HOME](#) [FUEL CYCLE OPTIONS](#) [FUEL CYCLE EVALUATION & SCREENING](#)

[Fuel Cycle - Home](#) > [homepage](#)

INFORMATION

- Nuclear Technologies
- Nuclear Fuels
- Nuclear Fuel Cycle Strategies
- Nuclear System Functions
- References

RESOURCES

- FAQs
- Contact
- User Feedback
- Contributors

The **Nuclear Fuel Cycle Options Catalog** is an interactive website that provides information about nuclear fuel cycles, their performance, and the technologies that may be used to implement them. The fuel cycles cover a broad range of possible options, including once-through and recycle. At the present time, information contained in the catalog is primarily based on analyses performed as part of the Fuel Cycle Research and Development Program in the **Department of Energy Office of Nuclear Energy** to improve understanding of differences in performance among various fuel cycles. These analyses inform the decision-making process at the Department of Energy for planning and conducting long-term research and development. The Catalog is being actively developed at this time, and periodic addition of new fuel cycle information is planned, which is anticipated to include input from additional contributors.

In 2014, an evaluation and screening study will be completed for the **United States Department of Energy** which will provide information about the potential benefits and challenges of nuclear fuel cycle options (i.e., the complete nuclear energy system from mining to disposal). This information could be used to strengthen the basis and provide guidance for the activities undertaken by the Department of Energy, Office of Nuclear Energy, Fuel Cycle Research and Development program. This catalog includes, but is not limited to, information that was part of the input used in the evaluation and screening study.



Catalog Contributors





Sandia National Laboratories





Purposes of the Catalog

- **Publicly-available resource of fuel cycle information**
- **Create, manage, and communicate traceable, searchable lists of fuel cycle system options and selected information on associated enabling technologies to support R&D investment decisions**
- **Provide an interactive tool to communicate the option space for nuclear fuel cycles**
- **Support R&D program planning by National Technical Directors and Federal managers**
- **Catalog hosted by Sandia National Laboratory**
 - Contributions to the Catalog to date have been from the DOE laboratories; future contributors are expected to include universities (mainly through the NEUP program) and others



Some Recent NEUP Calls for FCO

- **Develop Fuel Cycle Simulator, including fuel cycle modules, interface modules and data modules**
 - Develop modules for the fuel cycle simulator that support specific types of fuel cycles or fuel cycle technologies
- **Develop improved methods to communicate nuclear energy and advanced fuel cycle analyses to policy makers, decision makers, and the public**
- **Create fuel cycle options data for the Fuel Cycle Options Catalog**
- **Conduct systems economic studies looking at the potential impact of and sensitivity to natural gas prices on the future of the U.S. nuclear fleet; include the impact of projected coal power changes as well**



FCO NEUP Call for FY 2015 (FC-5) – Visualization Tool to Communicate Results

- **Program element is interested in development of a visualization tool to communicate to the public the outcomes of implementing different fuel cycles**
 - Focus will be on options that have been identified to offer promise in the Evaluation and Screening Study finalized by DOE-NE in 2014
- **Tool should allow comparative analysis of those nuclear energy systems to one another and a reference nuclear energy system and also to other energy sources, e.g., solar, biomass, oil, natural gas, wind, etc.**
- **The tool must be publicly available, easy and intuitive to use, and should be usable on different computer platforms, including laptop and handheld devices**



FCO NEUP Call for FY 2015 (FC-5) – Visualization Tool to Communicate Results

- [illegible]